AGENDA ITEM V A

PROPOSED ACADEMIC/RESEARCH UNIT

LOUISIANA STATE UNIVERSITY

Hurricane Center

BACKGROUND INFORMATION

At its meeting of March 22, 2000, the Board of Regents approved new Guidelines for Proposed New Centers, Institutes, and Other Similar Academic/Research Units. These Guidelines specify two different review procedures for proposed new academic/research units, depending on the projected source of funding. For those proposed units which anticipate support from non-state sources, the Regents will consider a one-year period of conditional approval, prior to submittal of a full proposal. For those proposed units which anticipate support from state sources, a full proposal will have to be considered and approved, prior to receiving any state funds.

Louisiana State University proposes the establishment of a Hurricane Research Center. The proposed Center has already attracted some external funding and the University will provide limited seed money from existing resources. Since no new state support is requested, the University seeks full approval for the proposed unit.

PROPOSAL SUMMARY

1. Description

The proposed Hurricane Research Center is designed to promote new interdisciplinary research activities, as well as enhance existing programs in related fields. Already, the University has active research interests in the areas of hurricane frequency/intensity, hurricane modeling, hurricane impact, hurricane preparedness, hurricane mitigation, hurricane response, and hurricane education. It is proposed to build upon these current efforts to include investigation into satellite tracking, hurricane climatology, the effects of wind and flood on structures, epidemiology of floods, and social and support networks for hurricane victims.

The mission of the proposed Center is to:

a. Advance the state-of-the-art knowledge of hurricanes and their impacts on the natural, built, and human environments;
b. Stimulate new multi-disciplinary/collaborative research activities;
c. Strengthen competitiveness of existing hurricane-related programs on campus;

d. Transfer research findings to the scientific community, students, and professionals in related fields;

e. Assist the State, the nation, and the world in mitigating the destructive effect of these storms; and
f. Increase the national and international visibility of LSU hurricane research programs.

The proposed Center will work actively to collaborate with other universities. Research proposals have already been developed with Southern University-Baton Rouge, the LSU Health Science Center, the University of New Orleans, Notre Dame University, the University of North Carolina at Chapel Hill, and the University of Missouri at Rolla.

2. Need

The proposed Center would be unique to Louisiana; only one such center currently exists in the nation–the National Hurricane Center at Florida International University. LSU has already examined closely the focus and operations of this similar unit to learn from its success. Unlike FIU, however, LSU will focus primarily on the natural sciences and engineering aspects of hurricane-related research.

The proposal contains much information and supporting documentation which spells out the devastating impact of hurricanes on the nation's and State's economy and the ever-increasing chances of major hurricane damage likely to occur in large population centers within the next few years, particularly in Louisiana.

3. Faculty

LSU has already identified 23 existing faculty from 10 different departments, over 7 different colleges/centers who will work directly with the proposed Center. There are no projections for additional faculty resources. Disciplines represented include: Atmospheric Science, Geography, Coastal Studies, Marine Sciences, Geology, Civil/Environmental Engineering, Mechanical Engineering, Environmental Studies, Anthropology, Sociology, Landscape Architecture, and Veterinary Medicine.

4. Facilities and Equipment

The Department of Civil/Environmental Engineering has provided space and furniture for administrative functions of the proposed Center. No new research facilities will be required; faculty associated with the Center will continue tom utilized available labs within their home departments/colleges. New equipment, as needed, will be acquired through research funding or existing revenues.

5. Administration

The proposed Center will be administered by a Director who will appoint a Deputy Director. Because of the interdisciplinary nature of the Center, the Director will appointed by and report directly to the Vice Chancellor for Research and Graduate Studies. Dr. Marc Levitan, Associate Professor of Civil/Environmental Engineering has been named as Director; Dr. Ivor van Heerden, Associate Professor with the Louisiana Geological Survey has been appointed Deputy Director. Both have extensive records in related research areas proposed for the Center. Both have also been instrumental in setting directions for the Center and obtaining faculty participation.

6. Budget

Internal Support

From its budget, LSU proposes the following resources:

	2000/01		**2001/02**		**2002/03**	**2003/04**	**2004/05**
Seed Funds[1]	20,000	10,000	5,000	2,000		2,000	
Fellowships[2]	10,000	20,000	30,000	40,000	30,000		
LSU Foundation	500	700	1,000	1,000	1,000		
Overhead Return[3]			6,608	5,049	5,936	6,400	
Total	**30,500**	**37,308**	**41,049**	**48,936**	**39,400**		

In addition, the Department of Civil/Environmental Engineering has already provided course release time (9 hrs.) for Dr. Levitan, and the Geological Survey has provided half-time salary support for Dr. van Heerden.

External Support

This budget above will be augmented by LSU's portion of a newly approved $500,000 grant from the National Science Foundation for the development of a Hurricane Engineering curriculum. This is a collaborative project with SUBR and the University of Missouri at Rolla. One other center-related proposal is pending: a request for $2,698,975 through the NSF for development of a doctoral program in hurricane science and engineering. Additional proposals are projected for the near future.

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[1]Seed monies from the Office of Research and Graduate Studies.

[2]Ph.D. fellowship support from the Office of Research and Graduate Studies.

[3]Return of overhead generate by currently funded and anticipated future funded projects.

7. Contingency Budget Plans

LSU will support Center operations from internal allocations and revenues from external grants and contracts. By Year 5, LSU anticipates that all costs should be covered through external grants only. Reasonable options are provided to reduce costs or obtain assistance from participating departments if absolutely necessary.

8. Length of Approval

LSU seeks full approval. The University conducts annual assessment of Center productivity and a full-scale five-year review. The University pledges to terminate the Center should accomplishments after five years not meet expectations.

STAFF ANALYSIS

The purposes of the proposed Center are appropriate to the role, scope, and mission of LSU and the research to be generated has great promise both for the State and the nation. The University has provided necessary internal resources to begin center operations, but support for research activities will rely solely on external revenues through competitive grants and contracts. It is relevant to note that the Center, at this time, has achieved external support only through a collaborative grant with the NSF involving two other institutions, specifically focused on curricular development. Other proposed research aspects of the Center are not currently funded externally.

Hence, while the staff supports establishment of the center, funding is not yet available to permit it to reach the goals and objectives which have been set for it.

STAFF RECOMMENDATION

The staff recommends approval for the proposed Hurricane Research Center at Louisiana State University and A&M College, beginning September 1, 2000 through June 30, 2003. If the University decides to extend Center operations beyond this period of approval , a request should be submitted to the Commissioner of Higher Education by May 1, 2003 addressing the Center's long-term financial viability.

AGENDA ITEM V B

PROPOSED ACADEMIC/RESEARCH UNIT

LOUISIANA STATE UNIVERSITY

Center for Rotating Machinery

BACKGROUND INFORMATION

At its meeting of March 22, 2000, the Board of Regents approved new Guidelines for Proposed New Centers, Institutes, and Other Similar Academic/Research Units. These Guidelines specify two different review procedures for proposed new academic/research units, depending on the projected source of funding. For those proposed units which anticipate support from non-state sources, the Regents will consider a one-year period of conditional approval, prior to submittal of a full proposal. For those proposed units which anticipate support from state sources, a full proposal will have to be considered and approved, prior to receiving any state funds.

Louisiana State University has already received Support Fund grants directly related to the establishment of the proposed Center and anticipates additional State research funds in the future. The University, therefore, seeks full approval for the proposed unit.

PROPOSAL SUMMARY

1. Description

The proposed Center for Rotating Machinery will focus on interdisciplinary research and development in close collaboration with associated industries. By providing cutting-edge technological innovations to solve complex problems in engineering systems, the proposed Center hopes to serve as an intellectual foundation to industries with a particular focus on long-range development.

Specifically, the proposed Center's activities will include:

a. Creating new knowledge which pushes the frontiers of science in Engineering Mechanics and Applied Mechanics by conducting scientific research in tribology, micro-mechanics, materials processing and technology, vibrations, sensor technology, and thermo-fluid dynamics of bearings and seals as applicable to rotating machinery.

b. Developing and transferring emerging technologies in microfabricated material structures for application in the area of rotating machinery.

c. Addressing the needs of industries in design, problem solving, and technology transfer by means of contact research.

d. Providing state-of-the-art quality education to graduates through research conducted in the Center, and to the engineering community and industries by means of targeted courses on relevant topics of interest.

Through partnerships with industry, the proposed Center will enable the College of Engineering at LSU and participating institutions to compete and obtain competitive grants and contracts for sponsored research and development, as well as attract outstanding students, fellows, and distinguished visiting scientists–all leading to enhanced visibility and national reputation. Consistent with the State of Louisiana Vision 2020 economic development plan, the proposed Center is designed to foster the next generation of mechanical components, material synthesis and fabrication techniques, and thus serve the needs of a large industrial base within the state. The initiation of the proposed Center should also stimulate sustainable science and technology in Louisiana and enhance LSU's ability to compete for federal and private R&D support, thereby fulfilling the EPSCoR competitiveness mission.

Examples of the initial scientific research plan include projects related to :

a. Thermal and dynamic instabilities of rotating machinery.

b. Need for improved design and material selection for next generation mechanical components.

c. System vibration assessment, reduction, and control.

d. Reliability and failure analysis.

e. Long-term durability of materials and components with emphasis on modeling and accelerated testing techniques.

2. Need

No similar research entity currently exists in Louisiana and, therefore, would be unique. LSU has already examined closely the focus and operations of similar units at the University of Virginia and Texas A&M University to learn from their successes.

According to the University, there is great potential and likelihood for Center research to lead to a whole new generation of industrial bearings and seals, with a significant market at the state, national, and international levels. It is projected that research in these areas will create significant new business opportunities in Louisiana. Given the State's current industrial base, the applications of such research would place Louisiana's industries at the forefront of new technologies. The proposal provides much evidence and economic/scholarly citations which support its claim of significant positive economic

impact from Center operations.

3. Faculty

The proposal identifies a cadre of fifteen current faculty from three different universities (LSU, SUBR, and UNO) who will be directly involved in Center research. Faculty represent the disciplines of Mechanical Engineering, Civil/Environmental Engineering, Petroleum Engineering, and Computing Microstructures and Devices. One of the proposed faculty members holds the Dow Chemical Endowed Chair in Rotating Machinery at LSU. Additional faculty affiliations are expected in the future, but there is no indication of new faculty needed to effect Center operations. Nine of these faculty are already supported in part through external research grants associated with Center goals.

4. Facilities and Equipment

The University has recently allocated 1860 sq. ft. of existing space in the Center for Engineering and Business Administration Building for Center purposes. This space, along with the existing Tribology Laboratory and Rotor Dynamics and Vibration Laboratory, should be adequate. LSU proposes to institute a new Rotating Field testing laboratory sometime in the near future. Existing laboratories are fully equipped; external funds shall be used to equip the new laboratory as necessary.

5. Administration

The proposed Center will be housed in the College of Engineering and administered by a Director. Dr. Michael Khonsari, the Dow Chemical Endowed Chair in Rotating Machinery, shall assume the director position and report directly to the College Dean.

6. Budget

LSU provided a complete five-year budget and abbreviated budget explanation. The annual projected budget and budget amounts already secured through external support are as follows:

Year	**Projected Budget**	**Budget Amount Secured**
Year 1	$ 789,000	All
Year 2	$ 966,000	$ 466,000
Year 3	$ 979,000	$ 466,000
Year 4	$1,015,000	$ 115,000
Year 5	$1,165,000	$ 115,000

After Year 1, the University projects that the difference between secured funds and the anticipated expenditures will be acquired through:

Year	Sources	Amount
Year 2	Industrial Memberships	$200,000
	Federal Grants	$200,000
	Institutional Support	$100,000
Year 3	Industrial Memberships	$200,000
	Federal Grants	$200,000
	Institutional Support	$100,000
Year 4	Industrial Memberships	$300,000
	Federal Grants	$400,000
	Institutional Support	$200,000
Year 5	Industrial Memberships	$300,000
	Federal Grants	$500,000
	Institutional Support	$250,000

Industrial Memberships - Contributions will be sought from industries represented on the College of Engineering's Advisory Board, industries with existing collaborations with the Department of Mechanical Engineering, and industries with concerns associated with the projected scope of research. The Director of the Center will direct personal marketing efforts.

External Grants - Since this proposal was submitted in June, 2000, the University has received another $32,838 from NASA for Center research and is preparing several additional proposals for support from external agencies. Currently pending are two applications through NSF: one for $271,704 for Year 2 and another for $2,000,000 for Years 2 through 5.

Institutional Support - No "Hard" dollars will be used to support Center operations. Support will be provided primary through released time for the Director and miscellaneous costs.

7. Contingency Budget Plans

LSU indicates that the Center will operate within the proposed budget and no institutional monies will be redirected to cover any shortfalls.

8. Length of Approval

The University notes that monies for Year 1 operations are already secured and that approximately half of the funding needed for Years 2 and 3 are already available. During FY 2000-2001 and beyond, the University will solicit additional long-term, non-state funding for the Center from state/federal grant agencies and industrial partners. Hence, the University is requesting full approval for the proposed Center.

STAFF ANALYSIS

The staff concludes that LSU's proposal for the Center for Rotating Machinery meets most requirements outlined in the Regents' Guidelines for Proposed New Centers, Institutes, and Other Similar Academic/Research Units for full approval for a non-state funded research unit. However, given that funding for Years 4 and 5 is unsure at this time, the staff recommends that the University be granted initially a three-year period of approval (September 1, 2000 through June 30, 2003). If the University decide to extend operations of the Center beyond this period, it should submit a supplementary request by May 1, 2003 which addresses funding concerns

STAFF RECOMMENDATION

The staff recommends approval for the proposed Center for Rotating Machinery at Louisiana State University and A&M College, beginning September 1, 2000 through June 30, 2003. If the University decides to extend Center operations beyond this period of approval , a supplementary request should be submitted to the Commissioner of Higher Education by May 1, 2003 addressing long-term funding concerns.